

Paper strengthened with solubilized collagen, and method for making the same

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The invention includes a method that produces a low cost aqueous solution of high molecular weight solubilized collagen by the steps of: (a) providing an aqueous ground slurry of insoluble collagen; (b) adjusting the water or solid content of the wet ground slurry whereby the insoluble collagen is at a concentration that promotes substantially maximum solubilized collagen concentration and molecular weight in a final product; (c) adjusting the pH of the slurry from Step b to obtain activity for a proteolytic enzyme added in Step d; (d) adding the proteolytic enzyme to the pH adjusted slurry and reacting at a temperature, T, and for a time, t, effective for forming high molecular weight solubilized collagen from the insoluble collagen particles; (e) controlling the reaction conditions for obtaining a high concentration of soluble collagen and a high molecular weight of the solubilized collagen by simultaneously measuring the concentration of solubilized collagen and the molecular weight of the solubilized collagen, whereby the reaction is complete when the molecular weight and the concentration are substantially maximized; and (f) withdrawing the aqueous solution of high molecular weight solubilized collagen as product. Proteolytic enzyme recycle steps are disclosed that can be used to further reduce costs.

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